

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of: **Bera, et al.**

Serial No.: 10/821,310

Examiner: Rudy Zervigon

Confirmation No.: 9721

**Title: APPARATUS FOR CONTROLLING
GAS FLOW IN A SEMICONDUCTOR
SUBSTRATE PROCESSING CHAMBER**

§ Case: 8549/ETCH/DRIE/JB1

§ Filed: April 8, 2004

§ Group Art Unit: 1763

تاریخ

MAIL STOP APPEAL BRIEF-PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

REPLY BRIEF

Appellants submit this Reply Brief to the Board of Patent Appeals and Interferences on appeal from the decision of the Examiner of Group Art Unit 1763 dated November 14, 2006, finally rejecting claims 1-3, 5-11, 13-16, and 18-30. One copy of this brief is submitted for use by the Board. Although Appellants believe that no fee is due in conjunction with this response, the Commissioner is hereby authorized to charge any fees necessary to make this reply timely and acceptable, including extension of time fees under 37 C.F.R. §1.136, to Deposit Account No. 20-0782.

Status of Claims

Claims 1-3, 5-11, 13-16 and 18-30 are pending in the application. Claims 1-22 were originally presented in the application. Claims 4, 12 and 17 have been canceled without prejudice and claims 23-25 have been added in the Response to Office Action dated August 26, 2005. Claims 26-28 have been added in the Response to Final Office Action dated November 4, 2005. Claims 29-30 have been added in the Response to Office Action dated June 5, 2006. Claim 23 has been amended in the Response to Final Office Action dated November 14, 2006. The Examiner, in his Advisory Action, has maintained the rejection of the pending claims, as amended on November 14, 2006, as being unpatentable for the same reasons set forth in the Final Office Action. In the Examiner's Answer mailed September 6, 2007, the Examiner issued a new rejection over claim 25. The final rejections of claims 1-3, 5-11, 13-16 and 18-30 are appealed.

Ground of Rejection to be Review on Appeal

1. Claims 23-25 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,448,536 B2 to *Li*.
2. Claims 1-3, 5, 6, 9-11, 14-16, 18, and 26-30 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,156,151 to *Komino et al.* in view of U.S. Patent No. 5,972,114 to *Yonenaga et al.*
3. Claims 7, 8, 13, and 19-22 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,156,151 to *Komino et al.* in view of U.S. Patent No. 5,972,114 to *Yonenaga et al.*

Argument

I. Claims 23-25 are not obvious over U.S. Patent No. 6,448,536 B2 to *Li*.

As acknowledged by the Examiner, *Li* does not disclose a restrictor plate supported within the processing chamber in a laterally space-apart relation relative to the substrate support pedestal and sidewalls of the processing chamber as recited in claim 23 (See Examiner's Answer, page 14). Additionally, the Examiner has acknowledged that *Li* does not disclose a predetermined gap between the restrictor plate and the sidewalls of the processing chamber (See Examiner's Answer, page 14). The Examiner, however, states that it would have been obvious to change the relative dimensions between the rectifying plate 26 of *Li* and the chamber walls of *Li* (See Examiner's Answer, page 15). Appellants respectfully disagree.

As shown by *Li* in Figure 1, the annular rectifying plate 26 abuts the chamber walls. Again, as noted by the Examiner, no gap exists between the rectifying plate 26 and the chamber wall (See Examiner's Answer, page 14). The rectifying plate 26 of *Li* permits gas to flow through a number of rectifying holes 25 to reach the exhaust line 27a (See column 5, lines 34-46). There are no other locations where gas may flow from the processing space to the exhaust line 27a in *Li* (See Figure 1). To change the flow to the exhaust line 27a, one of ordinary skill in the art would adjust the rectifying holes 25 of *Li*. As the holes 25 are what permits the flow of gas to the exhaust line 27a, one of ordinary skill in the art would naturally shrink the holes 25 to restrict the gas flow and widen the holes 25 to permit additional gas flow. Making the chamber larger or the rectifying plate 26 smaller solely to change the flow of gas to the exhaust line 27a would not be obvious in light of *Li*'s use of the rectifying holes 25 for flow control because the Examiner's asserted modification would eliminate or at least diminish the function, need and effectiveness of the holes. It is only through hindsight that one of ordinary skill in the art would make the chamber in *Li* larger or the rectifying plate 26 smaller while ignoring any change to the holes 25.

The Examiner has alternatively postulated that the holes 25, or the addition of additional holes 25 in *Li* would constitute the "second predetermined gap" recited in claim 23 and also the "laterally space apart relation relative to the substrate support pedestal and sidewalls of the processing chamber" as recited in claim 23 (See Examiner's Answer, page 16). Appellants respectfully disagree. In regards to the Examiner's "second predetermined gap" interpretation, the holes 25 of *Li* are not "between the restrictor plate and the sidewalls of the processing chamber" as recited in claim 23. The holes 25 of *Li* are within the rectifying plate 26. In regards to the Examiner's "laterally spaced apart relation" interpretation, again, the holes 25 of *Li* are within the rectifying plate 26. Thus, it is physically impossible for holes 25 of *Li* to place the rectifying plate 26 in "a laterally space-apart relation" as recited in claim 23.

Regarding claim 24, the Examiner has stated that Figure 2 of *Li* shows rectifying plate 26 separated at 120 degree increments into a plurality of pieces (See Examiner's Answer, page 19). Appellants respectfully disagree. In describing Figure 2, *Li* states that "[c]over members 44a and 44b are detachably fixed to the top surface of the shield frame 5 by screws to cover the temperature-detecting members 40" (See column 7, lines 50-53). Thus, Appellants respectfully assert that the rectifying plate 26 is not multiple pieces, but rather, has a portion of the cover members 44a, 44b extending thereover. Thus, the rectifying plate 26 of *Li* does not comprise a plurality of removable arc segments as recited in claim 24.

Regarding the new rejection of claim 25, the Examiner has stated that *Li* teaches the rectifying plate 26 to be supported by a plurality of support pins 5 (See Examiner's Answer, page 4). Appellants respectfully disagree. *Li* discloses the rectifying plate 26 to be disposed over a shield frame 5 (See column 5, lines 37-41). The shield frame 5 comprises an inner cylinder 5a and an outer cylinder 5b (See column 4, lines 32-34). There is no teaching, suggestion, or disclosure of the outer cylinder 5b to comprise a plurality of pieces in *Li*. Thus, *Li* does not disclose a plurality of support pins coupling the restrictor plate to a bottom of the processing chamber as recited in claim 25.

It is respectfully requested that the Board reverse the Examiner's rejection of claim 23-25.

II. Claims 1-3, 5, 6, 9-11, 14-16, 18, and 26-30 are not obvious over U.S. Patent No. 6,156,151 to *Komino et al.* in view of U.S. Patent No. 5,972,114 to *Yonenaga et al.*

Each of independent claims 1, 10, and 28 recite the limitation "a plurality of pins". In particular, claim 1 recites "at least one restrictor plate supported within the semiconductor processing chamber by a plurality of support pins." Claim 10 recites "at least one restrictor plate supported within the processing chamber by a plurality of support pins." Claim 28 recites "a plurality of pins extending between the restrictor plate and a bottom of the processing chamber." As an initial matter, it is again asserted that *Komino et al.* discloses the "central casing part CC is prepared by integrally molding a conductive material" (See column 4, lines 9-11; Figure 2). The central casing part CC comprises a lower baffle plate 118 and a suspension ring 118b (See column 6, lines 12-26). Thus, *Komino et al.* does not need a plurality of pins as recited in claims 1, 10, and 28. Appellants note that the Examiner has also not disputed that the restrictor plate and chamber wall of *Komino et al.* is a single integral piece.

The Examiner acknowledges that *Kimono et al.* does not disclose a plurality of support pins (See Examiner's Answer, page 7). To cure the deficiencies of *Komino et al.*, the Examiner refers to *Yonenaga et al.* According to the Examiner, *Yonenaga et al.* discloses a plurality of columns 48 to support the regulator plate 46 (See Examiner's Answer, page 10). Appellants respectfully disagree.

Yonenaga et al. discloses a "regulator plate 46 having a large number of flow regulator holes 44 [is] located around the table 4 so as to be supported by an annular support column 48" (See column 4, lines 4-6). Figure 1 of *Yonenaga et al.* is a "sectional view" (See column 2, line 66). In a sectional view, the item, in this case the annular support column 48, is cut in half. There is no location in *Yonenaga et al.* where more than one annular support column 48 is disclosed or suggested. Thus, *Yonenaga et al.* discloses only one column.

Because neither *Komino et al.* nor *Yonenaga et al.* disclose a plurality of pins as recited in independent claims 1, 10, and 28, it is respectfully asserted that it is only through hindsight reasoning that one of ordinary skill in the art would utilize a plurality of pins.

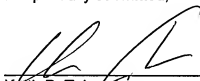
- III. Claims 7, 8, 13, and 19-22 are not obvious over U.S. Patent No. 6,156,151 to *Komino et al.* in view of U.S. Patent No. 5,972,114 to *Yonenaga et al.***

As the Examiner has provided no response to Appellants' arguments, Appellants respectfully direct the Board to the arguments presented in the Appeal Brief.

Conclusion

For the reasons advanced above, the Appellants respectfully urge that the rejections of claims 1-3, 5-11, 13-16 and 18-30 as being unpatentable under 35 U.S.C. §103 is improper. Reversal of the rejections in this appeal is requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'K. P. Taboada', is written over a horizontal line.

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